

***Methodology for Selecting Chemicals
for the
Voluntary Children's Chemical Evaluation Program
(VCCEP) Pilot***

Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
December 5, 2000

What is the Significance of a Chemical's Being Identified for the VCCEP?

The identification of chemicals for the Voluntary Children's Chemical Evaluation Program (VCCEP) was one of the more challenging aspects of the program's development. Both EPA and some stakeholders agree that available data sources provided limited insight on children's exposure to chemicals. Consequently, to identify chemicals for the VCCEP, EPA used existing data sources believed to be especially relevant to children's chemical exposures, such as presence of the chemical in human tissues and fluids (blood, breath, breast milk, urine) as well as presence in food and water children eat and drink and in air children breathe. EPA acknowledges that the chemical identification process does not take into account the unique aspects of children's potential for exposure, based on their behaviors and activities. For this reason, EPA wishes to make clear what the list of chemicals selected for the VCCEP represents and what it does not represent.

Identification for the VCCEP does not mean that the existing hazard and exposure data have been or will be determined to be inadequate. Nor does it mean that EPA has made or will make a determination that any uses of the chemical in fact pose significant risks to children's health. The level of potential risk to children will be determined as part of the VCCEP. The chemical identification process for the VCCEP did not make this determination.

It is important to note that as part of this program EPA has not made judgements regarding the adequacy or significance of existing hazard or exposure data for any of the chemicals selected for the pilot. While EPA recognizes that many of these chemicals are known to be relatively "data rich," assessment of the adequacy and significance of hazard and exposure information will be a task of the sponsors participating in the voluntary program. It is also important to note that for any given chemical in the VCCEP, EPA may ultimately determine that reasonably anticipated exposures and risks from expected uses do not pose any unique or other concerns for children's health and safety.

How Were Potential Candidate Chemicals for the VCCEP Identified?

After considering the individual comments offered by some of the stakeholders during the public meetings and in comments submitted to the docket (Refs. 1 and 2), EPA decided to focus this program on chemicals which have been found to be present as contaminants in:

- Human tissues or fluids (e.g., adipose tissue, blood, breath, breast milk, urine)
- Food and water children may eat and drink.
- Air children may breathe, including residential or school air.

As a first step in the VCCEP chemical selection process, EPA identified chemicals which were found by biomonitoring data to be present in human tissues or fluids based on data gathered by the following programs:

- National Health and Nutrition Examination Survey III (NHANES III).
- National Human Adipose Tissue Survey (NHATS).
- National Human Exposure Assessment Survey (NHEXAS).
- Total Exposure Assessment Methodology (TEAM).

These programs are described in Appendix I of this document. The biomonitoring data sets resulting from these programs contain the over 150 chemicals listed in Table 1. Electronic data files compiled for the Endocrine Disruptor Screening and Testing Program were used as the starting point for the chemical selection exercise. In general, for this effort, the primary sources for these data were not reviewed unless issues arose concerning the interpretation of specific data points in the electronic files. A detailed description of how these data files were developed can be found in the “Draft Users Guide for the Endocrine Disruptor Priority Setting Database” (Ref. 4) which can be found at www.epa.gov/scipoly/oscpendo/prioritysetting/index.

Table 1: Chemicals Monitored for in Select Human Biological Monitoring Programs					
CAS No.	CHEMICAL NAME	NHANES	NHATS	NHEXAS	TEAMS
50-29-3	ethane, 1,1,1-trichloro-2,2-bis(p-chlorophenyl)-		x		
50-32-8	benzo(a)pyrene		x		
53-19-0	ethane, 2-(o-chlorophenyl)-2-(p-chlorophenyl)-1,1-dichloro-		x		
53-70-3	dibenz a,h anthracene		x		
56-23-5	carbon tetrachloride				x
56-55-3	benz(a)anthracene		x		
57-74-9	chlordane		x		
58-89-9	lindane (Gamma isomer of benzene hexachloride) (99% pure gamma		x		
60-57-1	1,4:5,8-Dimethanonaphthalene,		x		
62-73-7	dichlorvos		x		
67-64-1	acetone	x			
67-66-3	chloroform	x		x	x
71-43-2	benzene	x		x	x
71-55-6	methyl chloroform	x			x
72-20-8	1,4:5,8-dimethanonaphthalene,		x		
72-43-5	methoxychlor		x		
72-54-8	DDD		x		
72-55-9	ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)-		x		
72-56-0	ethane, 2,2-bis(p-ethylphenyl)-1,1-dichloro-		x		
75-25-2	tribromomethane				x
75-27-4	bromodichloromethane				x
75-35-4	vinylidenechloride				x
76-44-8	heptachlor		x		
77-47-4	hexachlorocyclopentadiene		x		
78-59-1	isophorone		x		
78-93-3	methyl ethyl ketone	x			
79-01-6	trichloroethylene	x			x
79-34-5	1,1,2,2-tetrachloroethane				x
80-56-8	α-pinene				x
82-68-8	pentachloronitrobenzene		x		
83-32-9	acenaphthene		x		
83-33-0	1-Indanone		x		
84-66-2	diethyl phthalate	x ¹	x		
84-74-2	dibutyl phthalate	x ¹	x		
85-01-8	phenanthrene		x		
85-68-7	butyl benzyl phthalate	x ¹	x		
86-73-7	fluorene		x		
87-40-1	2,4,6-trichloroanisole		x		
87-61-6	1,2,3-trichlorobenzene		x		
87-68-3	hexachlorobutadiene		x		

Table 1: Chemicals Monitored for in Select Human Biological Monitoring Programs					
CAS No.	CHEMICAL NAME	NHANES	NHATS	NHEXAS	TEAMS
88-06-2	phenol, 2,4,6-trichloro-		x		
90-15-3	1-naphthol			x	
90-43-7	o-phenylphenol		x		
91-20-3	naphthalene		x		
91-22-5	quinoline		x		
91-64-5	coumarin		x		
92-52-4	biphenyl		x		
95-44-3	L-threose		x		
95-47-6	o-xylene	x			x
95-50-1	o-dichlorobenzene		x		x
95-63-6	1,2,4-trimethylbenzene		x		
95-95-4	phenol, 2,4,5-trichloro-		x		
96-12-8	propane, 1,2-dibromo-3-chloro-		x		
98-82-8	isopropylbenzene		x		
100-41-4	ethylbenzene	x			x
100-42-5	styrene	x			x
103-23-1	diethyl hexyl adipate		x		
105-05-5	p-diethylbenzene		x		
106-42-3	p-xylene				x
106-46-7	p-dichlorobenzene	x	x		x
106-93-4	ethylene dibromide				x
107-06-2	ethylene dichloride				x
108-38-3	m-xylene				x
108-70-3	benzene, 1,3,5-trichloro-		x		
108-88-3	toluene	x			x
108-90-7	chlorobenzene	x			x
112-40-3	n-dodecane				x
115-32-2	dicofol		x		
115-86-6	phosphoric acid, triphenyl ester		x		
115-96-8	ethanol, 2-chloro-, phosphate (3:1)		x		
117-81-7	di(2-ethylhexyl)phthalate	x ¹	x		
117-84-0	di-n-octyl phthalate	x ¹	x		
118-74-1	hexachlorobenzene		x		
120-82-1	benzene, 1,2,4-trichloro-		x		
123-91-1	p-dioxane				x
124-11-8	isononene		x		
124-18-5	decane				x
124-48-1	methane, dibromochloro-				x
124-76-5	isoborneol		x		
126-72-7	1-propanol, 2,3-dibromo-, phosphate (3:1)		x		
126-73-8	tributyl phosphate		x		
127-18-4	tetrachloroethylene	x		x	x

Table 1: Chemicals Monitored for in Select Human Biological Monitoring Programs					
CAS No.	CHEMICAL NAME	NHANES	NHATS	NHEXAS	TEAMS
128-37-0	2,6-di-tert-butyl-p-cresol		x		
129-00-0	pyrene		x		
131-11-3	dimethyl phthalate		x		
132-64-9	dibenzofuran		x		
141-93-5	m-diethylbenzene		x		
142-92-7	acetic acid, hexyl ester		x		
205-99-2	benzo(b)fluoranthene		x		
206-44-0	fluoranthene		x		
207-08-9	benzo(k)fluoranthene		x		
208-96-8	acenaphthalene		x		
218-01-9	chrysene		x		
309-00-2	1,4:5,8-dimethanonaphthalene,		x		
319-84-6	cyclohexane, 1,2,3,4,5,6-hexachloro-, .alpha.-		x		
319-85-7	cyclohexane, 1,2,3,4,5,6-hexachloro-, beta-isomer		x		
319-86-8	cyclohexane, 1,2,3,4,5,6-hexachloro-, .delta.-		x		
333-41-5	diazinon			x	
510-15-6	benzilic acid, 4,4'-dichloro-, ethyl ester		x		
527-84-4	o-cymene		x		
541-73-1	m-dichlorobenzene		x		x
556-67-2	octamethylcyclotetrasiloxane		x		
608-93-5	benzene, pentachloro-		x		
615-13-4	2-indanone		x		
630-20-6	1,1,1,2-tetrachloroethane				x
634-66-2	benzene, 1,2,3,4-tetrachloro-		x		
634-90-2	benzene, 1,2,3,5-tetrachloro-		x		
789-02-6	ethane, 2-(o-chlorophenyl)-2-(p-chlorophenyl)-1,1,1-trichloro-		x		
933-75-5	phenol, 2,3,6-trichloro-		x		
1024-57-3	heptachlorepoxyde		x		
1120-21-4	undecane				x
1330-20-7	mixed xylene	x			
1330-78-5	phosphoric acid, tritoyl ester		x		
1746-01-6	dibenzo-p-dioxin, 2,3,7,8-tetrachloro-		x		
1825-21-4	anisole, 2,3,4,5,6-pentachloro-		x		
1836-75-5	ether, 2,4-dichlorophenyl p-nitrophenyl		x		
2021-28-5	hydrocinnamic acid, ethyl ester		x		
2051-24-3	decahlorobiphenyl		x		
2234-13-1	naphthalene, octachloro-		x		
2385-85-5	mirex		x		
2847-30-5	pyrazine, 2-methoxy-3-methyl-		x		
2921-88-2	chlorphyrifos		x	x	
3268-87-9	dibenzo-p-dioxin, 1,2,3,4,6,7,8,9-octachloro-		x		
3424-82-6	o,p'-DDE		x		

Table 1: Chemicals Monitored for in Select Human Biological Monitoring Programs					
CAS No.	CHEMICAL NAME	NHANES	NHATS	NHEXAS	TEAMS
5989-27-5	p-mentha-1,8-diene, (R)-(+)-		x		
7439-92-1	lead			x	
7439-97-6	mercury			x	
7440-38-2	arsenic			x	
12789-03-6	chlordanes		x		
23184-66-9	butachlor		x		
25323-68-6	trichlorobiphenyl		x		
25429-29-2	pentachlorobiphenyl		x		
25512-42-9	dichloro-1,1'-biphenyl		x		
26601-64-9	hexachlorobiphenyl		x		
26914-33-0	tetrachlorobiphenyl		x		
28553-12-0	diisononyl phthalate	x ¹			
28655-71-2	heptachlorobiphenyl		x		
31472-83-0	octachlorobiphenyl		x		
33820-53-0	isopropalin		x		
34465-46-8	hexachlorodibenzo-p-dioxin		x		
35822-46-9	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin		x		
39001-02-0	octachlorodibenzofuran		x		
39765-80-5	trans-nonachlor		x		
40088-47-9	tetrabromodiphenyl ether		x		
40321-76-4	1,2,3,7,8-pentachlorodibenzo-p-dioxin		x		
50375-10-5	2,3,6-trichloroanisole		x		
51207-31-9	dibenzofuran, 2,3,7,8-tetrachloro-		x		
53494-70-5	endrin ketone		x		
53742-07-7	nonachloro-1,1'-biphenyl		x		
54135-80-7	1,2,3-trichloro-4-methoxybenzene		x		
55684-94-1	hexachlorodibenzofuran		x		
57117-31-4	dibenzofuran, 2,3,4,7,8-pentachloro-		x		
67562-39-4	dibenzofuran, 1,2,3,4,6,7,8-heptachloro-		x		
67708-83-2	dibromochloropropane				x

¹ Metabolites of chemicals with this footnote were found in human urine as reported in Ref. 5 which was just recently published in Oct. 2000. Earlier presentations to Stakeholders did not reflect this new work

What Were Some Other Considerations Used When EPA Identified Potential Candidate Chemicals?

EPA removed chemicals contained in Table 1 from consideration as candidates for VCCEP if:

- They are not chemicals produced in or imported into the United States in an amount sufficient to meet TSCA Inventory Update Rule (IUR) reporting criteria for the 1998 reporting period.
- They are chemicals being phased out under the Montreal Protocol.
- They are chemicals whose risks to children are believed by EPA to be adequately managed by other ongoing programs.
- Further evaluation of the biomonitoring data indicated that the chemical was monitored for but not detected

The chemicals listed in Table 2 are the Table 1 chemicals removed from consideration in the VCCEP. Table 3 is the resulting list of chemicals detected in select biomonitoring programs and considered as potential candidate chemicals for the VCCEP.

Table 2: Chemicals Removed from Consideration in the VCCEP					
CAS No.	CHEMICAL NAME	Not Reported to TSCA IUR	Ozone Depletor banned under the Montreal Protocol	Other Ongoing Risk Management	Not Detected in Biomonitoring
50-29-3	ethane, 1,1,1-trichloro-2,2-bis(p-chlorophenyl)-	x			
50-32-8	benzo(a)pyrene	x			x
53-19-0	ethane, 2-(o-chlorophenyl)-2-(p-chlorophenyl)-1,1-dichloro-	x			x
53-70-3	dibenz a,h anthracene	x			x
56-23-5	carbon tetrachloride		x		
56-55-3	benz(a)anthracene	x			
57-74-9	chlordanes	x			x
60-57-1	1,4:5,8-Dimethanonaphthalene,	x			
67-66-3	chloroform			x	
71-55-6	methyl chloroform		x		
72-20-8	1,4:5,8-dimethanonaphthalene,	x			x
72-43-5	methoxychlor	x			x
72-54-8	DDD	x			
72-55-9	ethylene, 1,1-dichloro-2,2-bis(p-chlorophenyl)-	x			
72-56-0	ethane, 2,2-bis(p-ethylphenyl)-1,1-dichloro-	x			x
75-27-4	bromodichloromethane	x			
76-44-8	heptachlor	x			x
77-47-4	hexachlorocyclopentadiene				x
82-68-8	pentachloronitrobenzene				x

Table 2: Chemicals Removed from Consideration in the VCCEP

CAS No.	CHEMICAL NAME	Not Reported to TSCA IUR	Ozone Depletor banned under the Montreal Protocol	Other Ongoing Risk Management	Not Detected in Biomonitoring
83-32-9	acenaphthene	x			x
83-33-0	1-Indanone	x			
85-01-8	phenanthrene	x			
86-73-7	fluorene				x
87-40-1	2,4,6-trichloroanisole	x			x
87-61-6	1,2,3-trichlorobenzene				x
87-68-3	hexachlorobutadiene	x			x
88-06-2	phenol, 2,4,6-trichloro-	x			x
95-44-3	L-threose	x			x
95-95-4	phenol, 2,4,5-trichloro-	x			x
96-12-8	propane, 1,2-dibromo-3-chloro-	x			x
105-05-5	p-diethylbenzene				x
108-70-3	benzene, 1,3,5-trichloro-	x			
115-32-2	dicofol	x			
124-11-8	isononene	x			
124-48-1	methane, dibromochloro-	x			
124-76-5	isoborneol				x
126-72-7	1-propanol, 2,3-dibromo-, phosphate (3:1)	x			x
129-00-0	pyrene				x
131-11-3	dimethyl phthalate				x
132-64-9	dibenzofuran	x			
205-99-2	benzo(b)fluoranthene	x			x
206-44-0	fluoranthene	x			
207-08-9	benzo(k)fluoranthene	x			
208-96-8	acenaphthalene	x			x
218-01-9	chrysene	x			
309-00-2	1,4:5,8-dimethanonaphthalene,	x			x
319-84-6	cyclohexane, 1,2,3,4,5,6-hexachloro-, .alpha.-				x
319-85-7	cyclohexane, 1,2,3,4,5,6-hexachloro-, beta-isomer	x			
319-86-8	cyclohexane, 1,2,3,4,5,6-hexachloro-, .delta.-	x			x
510-15-6	benzilic acid, 4,4'-dichloro-, ethyl ester	x			x
527-84-4	o-cymene	x			
608-93-5	benzene, pentachloro-	x			x
615-13-4	2-indanone	x			x
634-66-2	benzene, 1,2,3,4-tetrachloro-				x
634-90-2	benzene, 1,2,3,5-tetrachloro-	x			x
789-02-6	ethane, 2-(o-chlorophenyl)- 2-(p-chlorophenyl)-1,1,1-trichloro-	x			x
933-75-5	phenol, 2,3,6-trichloro-	x			x
1024-57-3	heptachlorepoxyde	x			

Table 2: Chemicals Removed from Consideration in the VCCEP					
CAS No.	CHEMICAL NAME	Not Reported to TSCA IUR	Ozone Depletor banned under the Montreal Protocol	Other Ongoing Risk Management	Not Detected in Biomonitoring
1746-01-6	dibenzo-p-dioxin, 2,3,7,8-tetrachloro-	x			
1825-21-4	anisole, 2,3,4,5,6-pentachloro-	x			x
1836-75-5	ether, 2,4-dichlorophenyl p-nitrophenyl	x			
2021-28-5	hydrocinnamic acid, ethyl ester	x			
2051-24-3	decachlorobiphenyl	x			
2234-13-1	naphthalene, octachloro-	x			
2385-85-5	mirex	x			
2847-30-5	pyrazine, 2-methoxy-3-methyl-	x			x
2921-88-2	chlorphyrifos	x			
3268-87-9	dibenzo-p-dioxin, 1,2,3,4,6,7,8,9-octachloro-	x			
3424-82-6	o,p'-DDE	x			x
5989-27-5	p-mentha-1,8-diene, (R)-(+)-				x
7439-92-1	lead			x	
7439-97-6	mercury			x	
7440-38-2	arsenic			x	
12789-03-6	chlordanes	x			x
23184-66-9	butachlor	x			
25323-68-6	trichlorobiphenyl	x			
25429-29-2	pentachlorobiphenyl	x			
25512-42-9	dichloro-1,1'-biphenyl	x			
26601-64-9	hexachlorobiphenyl	x			
26914-33-0	tetrachlorobiphenyl	x			
28655-71-2	heptachlorobiphenyl	x			
31472-83-0	octachlorobiphenyl	x			
33820-53-0	isopropalin	x			
34465-46-8	hexachlorodibenzo-p-dioxin	x			
35822-46-9	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	x			
39001-02-0	octachlorodibenzofuran	x			
39765-80-5	trans-nonachlor	x			
40088-47-9	tetrabromodiphenyl ether				x
40321-76-4	1,2,3,7,8-pentachlorodibenzo-p-dioxin	x			
50375-10-5	2,3,6-trichloroanisole	x			x
51207-31-9	dibenzofuran, 2,3,7,8-tetrachloro-	x			
53494-70-5	endrin ketone	x			x
53742-07-7	nonachloro-1,1'-biphenyl	x			
54135-80-7	1,2,3-trichloro-4-methoxybenzene	x			
55684-94-1	hexachlorodibenzofuran	x			
57117-31-4	dibenzofuran, 2,3,4,7,8-pentachloro-	x			
67562-39-4	dibenzofuran, 1,2,3,4,6,7,8-heptachloro-	x			

Table 2: Chemicals Removed from Consideration in the VCCEP					
CAS No.	CHEMICAL NAME	Not Reported to TSCA IUR	Ozone Depletor banned under the Montreal Protocol	Other Ongoing Risk Management	Not Detected in Biomonitoring
67708-83-2	dibromochloropropane	x			

Table 3: Chemicals Detected in Select Biomonitoring Programs and Considered Potential Candidate Chemicals for VCCEP					
CAS No.	CHEMICAL NAME	NHANES	NHATS	NHEXAS	TEAMS
58-89-9	lindane		x		
62-73-7	dichlorvos		x		
67-64-1	acetone	x			
71-43-2	benzene	x		x	x
75-25-2	tribromomethane				x
75-35-4	vinylidenechloride				x
78-59-1	isophorone		x		
78-93-3	methyl ethyl ketone	x			
79-01-6	trichloroethylene	x			x
79-34-5	1,1,2,2-tetrachloroethane				x
80-56-8	α-pinene				x
84-66-2	diethyl phthalate	x ¹	x		
84-74-2	dibutyl phthalate	x ¹	x		
85-68-7	butyl benzyl phthalate	x ¹	x		
90-15-3	1-naphthol			x	
90-43-7	o-phenylphenol		x		
91-20-3	naphthalene		x		
91-22-5	quinoline		x		
91-64-5	coumarin		x		
92-52-4	biphenyl		x		
95-47-6	o-xylene	x			x
95-50-1	o-dichlorobenzene		x		x
95-63-6	1,2,4-trimethylbenzene		x		
98-82-8	isopropylbenzene		x		
100-41-4	ethylbenzene	x			x
100-42-5	styrene	x			x
103-23-1	diethyl hexyl adipate		x		
106-42-3	p-xylene				x
106-46-7	p-dichlorobenzene	x	x		x
106-93-4	ethylene dibromide				x
107-06-2	ethylene dichloride				x
108-38-3	m-xylene				x
108-88-3	toluene	x			x
108-90-7	chlorobenzene	x			x
112-40-3	n-dodecane				x
115-86-6	phosphoric acid, triphenyl ester		x		
115-96-8	ethanol, 2-chloro-, phosphate (3:1)		x		
117-81-7	di(2-ethylhexyl)phthalate	x ¹	x		
117-84-0	di-n-octyl phthalate	x ¹	X		
118-74-1	hexachlorobenzene		X		
120-82-1	benzene, 1,2,4-trichloro		X		

Table 3: Chemicals Detected in Select Biomonitoring Programs and Considered Potential Candidate Chemicals for VCCEP					
CAS No.	CHEMICAL NAME	NHANES	NHATS	NHEXAS	TEAMS
123-91-1	p-dioxane				X
124-18-5	decane				X
126-73-8	tributyl phosphate		X		
127-18-4	tetrachloroethylene	X		X	X
128-37-0	2,6-di-tert-butyl-p-cresol		X		
141-93-5	m-diethylbenzene		X		
142-92-7	acetic acid, hexyl ester		X		
333-41-5	diazinon			X	
541-73-1	m-dichlorobenzene		X		X
556-67-2	octamethylcyclotetrasiloxane		X		
630-20-6	1,1,1,2-tetrachloroethane				X
1120-21-4	undecane				X
1330-20-7	mixed xylene	X			
1330-78-5	phosphoric acid, tritoyl ester		X		
28553-12-0	diisononylphthalate (DINP)	X ¹			

¹ Metabolites of chemicals with this footnote were found in human urine as reported in Ref. 5 which was just recently published in Oct., 2000. Earlier presentations to Stakeholders did not reflect this new work

How Did EPA further Cull the Potential Candidate Chemicals to Ensure VCCEP Focuses on Relevant Chemicals?

In an effort to identify chemicals to which children would have the highest likelihood of exposure, EPA evaluated each chemical listed in Table 3 to determine whether environmental data also indicates that it may be present in a person's environment (in food, drinking water, indoor air). If a chemical listed in Table 3 was found in at least one environmental database listed below, it was identified as a candidate for the VCCEP:

- FDA database of Everything Added to Food in the United States (EAFUS).
- National Contaminant Occurrence Database (NCOD) (includes unregulated drinking water contaminants).
- National Human Exposure Assessment Survey (NHEXAS).
- Total Exposure Assessment Methodology (TEAM).
- EPA Office of Research and Development studies and other published indoor air data.

The last three data sets were used to identify chemicals found in indoor air. Descriptions of these environmental data bases are available in Appendix I of this document, and also in Refs. 3 and 4.

There was an exception to the above identification process which was raised and discussed during the last stakeholder meeting. This exception relates to polybrominated diphenyl ethers which as a class of chemicals were found to be increasing in concentration in human breast milk in a recent Swedish study (Ref. 6). EPA used this study and TSCA Inventory Update Rule reporting, which indicates that chemicals are manufactured in or imported to the United States, to identify specific chemicals and their CAS Registry Numbers from this class of chemicals to be included as candidate chemicals for this program (Ref. 13). In the case of chemicals contained in breast milk, the biomonitoring evidence of exposure of the mother is also environmental evidence of potential exposure through a food source of the child. Therefore the listing of the chemicals in an environmental data base was not required for the chemical's selection.

EPA believes that lindane, dichlorvos, o-phenylphenol and diazinon although reported to the TSCA Inventory Update Rule, did not have significant TSCA uses. Therefore these chemicals were removed from VCCEP consideration. Coumarin was removed from consideration because although it is included in EAFUS, it is a banned food additive.

The results of EPA's VCCEP candidate chemical selection process is shown in Table 4.

**Table 4: Working List of Candidate Chemicals to be Addressed by the
Voluntary Children's Chemical Evaluation Program**

CAS No.	CHEMICAL NAME	Chemicals found in Human Tissues					Chemicals Found in Drinking Water, Food and/or Indoor Air		
		NHANES	NHAT	NHEXAS	TEAMS	Human Milk ¹	NCOD	EAFUS	INDOOR AIR
67-64-1	acetone	Y						Y	Y
71-43-2	benzene	Y		Y	Y		Y	Y	Y
75-25-2	tribromomethane				Y		Y		Y
75-35-4	vinylidenechloride				Y		Y		Y
78-59-1	isophorone		Y					Y	
78-93-3	methyl ethyl ketone	Y						Y	Y
79-01-6	trichloroethylene	Y		Y	Y		Y	Y	Y
79-34-5	1,1,2,2-tetrachloroethane				Y		Y		Y
80-56-8	α-pinene				Y			Y	Y
84-66-2	diethylphthalate	Y ²	Y						Y
84-74-2	dibutyl phthalate	Y ²	Y						Y
85-68-7	butyl benzyl phthalate	Y ²	Y						Y
91-20-3	naphthalene		Y				Y		
91-22-5	quinoline		Y					Y	Y
92-52-4	biphenyl		Y					Y	
95-47-5	o-xylene	Y			Y		Y		Y
95-50-1	o-dichlorobenzene		Y		Y		Y		Y
95-63-6	1,2,4-trimethylbenzene		Y				Y		Y
98-82-8	isopropylbenzene		Y				Y		Y
100-41-4	ethylbenzene	Y			Y		Y		Y
100-42-5	styrene	Y			Y		Y	Y	Y
103-23-1	diethyl hexyl adipate		Y				Y		
106-42-3	p-xylene				Y		Y		Y
106-46-7	p-dichlorobenzene	Y	Y		Y		Y		Y
106-93-4	ethylene dibromide				Y		Y		Y

**Table 4: Working List of Candidate Chemicals to be Addressed by the
Voluntary Children's Chemical Evaluation Program**

CAS No.	CHEMICAL NAME	Chemicals found in Human Tissues					Chemicals Found in Drinking Water, Food and/or Indoor Air		
		NHANES	NHAT	NHEXAS	TEAMS	Human Milk ¹	NCOD	EAFUS	INDOOR AIR
107-06-2	ethylene dichloride				Y		Y	Y	Y
108-38-3	m-xylene				Y		Y		Y
108-88-3	toluene	Y			Y		Y		Y
108-90-7	chlorobenzene	Y			Y		Y		Y
112-40-3	n-dodecane				Y				Y
117-81-7	di(2-ethylhexyl)phthalate	Y ²	Y				Y		Y
117-84-0	di-n-octyl phthalate	Y ²	Y						Y
118-74-1	hexachlorobenzene		Y				Y		Y
120-82-1	benzene, 1,2,4-trichloro		Y						Y
123-91-1	p-dioxane				Y				Y
124-18-5	decane				Y				Y
126-73-8	tributyl phosphate		Y						Y
127-18-4	tetrachloroethylene	Y		Y	Y		Y		Y
128-37-0	2,6-di-tert-butyl-p-cresol		Y					Y	
141-93-5	m-diethylbenzene		Y						Y
142-92-7	acetic acid, hexyl ester		Y					Y	
541-73-1	m-dichlorobenzene		Y		Y		Y		Y
556-67-2	octamethylcyclotetrasiloxane		Y						Y
630-20-6	1,1,1,2-tetrachloroethane				Y		Y		Y
1120-21-4	undecane				Y				Y
1163-19-5	decabromodiphenyl ether					Y			
1330-20-7	mixed xylenes	Y					Y		Y
32534-81-9	pentabromodiphenyl ether					Y			
32536-52-0	octabromodiphenyl ether					Y			
68928-80-3	heptabromodiphenyl ether					Y			

1. The chemicals in this column were chemicals identified in Ref. 6 that were also reported to the TSCA IUR

2. Metabolites of chemicals with this footnote were found in human urine as reported in Ref.5 which was just recently published in Oct., 2000. Earlier presentations to Stakeholders did not reflect this new work

What Chemicals Were Identified for the VCCEP Pilot?

The names of the 23 chemicals identified for the VCCEP pilot program are listed in Table 5 in Chemical Abstracts Service (CAS) Registry Number order.

A factor which influenced a chemical's selection for the pilot program was the expected availability of hazard data. For purposes of the pilot, EPA wanted to select chemicals which had or would soon have Tier 1 hazard data available. To identify such chemicals, EPA used two indications of data availability:

- whether data in the form of a Screening Information Assessment Report was available from the Organization for Economic Cooperation and Development (OECD) Screening Information Data Set (SIDS) Program as reported on www.oecd.org/ehs/sidstable/index.htm (Ref. 7), and
- whether chemicals had existing commitments in the HPV Challenge Program that had early start years, i.e. 2000 or 2001 as reported on www.epa.gov/chemrtk/hpv_1990.htm (Ref. 8).

Table 5 indicates which chemicals have been sponsored in the HPV Challenge Program with start years 2000 or 2001, and which chemicals have available SIDS data.

In addition, while selecting chemicals for the VCCEP pilot, EPA considered the following:

- Chemicals were deferred from the VCCEP Pilot if the only biomonitoring or environmental data supporting their selection were from NHATS or EAFUS. This approach was taken because several stakeholders questioned whether these data sets were appropriate for this chemical selection application.
- Several phthalate esters were included in the "Working List of Candidate Chemicals to be Addressed by the VCCEP" presented in Table 4 but were not included in Table 5 which lists "Chemicals Identified for the VCCEP Pilot" despite the fact that the selection criteria used indicates that they were Pilot-eligible. This approach was taken because EPA is aware that several phthalates are currently the subjects of assessments being performed by other government agencies, including some assessments that are specifically addressing potential exposures and hazards to children. These other assessments include:
 - (1) The National Toxicology Program (NTP) Center for the Evaluation of Risks to Human Reproduction (CERHR) which is preparing detailed assessments of the scientific evidence for whether a given exposure or exposure circumstance may pose a hazard to reproduction and the health and welfare of children for seven phthalates – dibutyl phthalate (DBP), butylbenzyl phthalate (BBP), di-n-hexyl phthalate (DnHP), di-n-octyl phthalate (DnOP), di(2-ethylhexyl) phthalate (DEHP), diisononyl phthalate (DINP), and diisodecyl phthalate (DIDP). A

separate assessment is being prepared for each phthalate by an expert panel chosen specifically for the phthalates. Each assessment will be an evaluation of the scientific evidence for whether adverse reproductive/developmental health effects are associated with exposures to the phthalate and will include the expert panel's conclusions about knowledge gaps for the phthalate (Ref. 10). Additional information is available on web site <http://ntp-server.niehs.nih.gov/htdocs/liason/CERHRPhthalatesAnnct.html>.

- (2) The Consumer Product Safety Commission (CPSC) has convened a Chronic Hazard Advisory Panel (CHAP) to evaluate the existing information regarding whether chronic hazards (cancer, birth defects and gene mutations) may be posed by DINP and the implications of these hazards on risks to children. The CHAP expert panel will evaluate available hazard and exposure information, including data generated by the CPSC in its testing laboratory on the amount of DINP that is likely to come out of a toy when chewed or mouthed by a young child (Ref. 11).
- (3) The Food and Drug Administration (FDA) is preparing a risk assessment of DEHP in medical devices, including medical devices that result in exposure to infants and newborn babies (Ref. 12). Additional information is available on web site www.fda.gov/cdrh/present/DEHP_GHTF.pdf.

In addition, risk assessments of DBP, BBP, DEHP, DINP and DIDP are being conducted by scientists in the European Union (EU).

Most of these assessments are close to being complete. It would be neither practical nor efficient to attempt to repeat all of the work of these other assessments under the VCCEP program, but EPA believes the outcome of these assessments will provide helpful information for deciding whether the risks of phthalates to children have been adequately characterized, and which, if any, of the phthalates are appropriate for inclusion in the VCCEP. In some cases, the work of these other bodies may facilitate review of phthalates under the VCCEP. In other cases, EPA may determine that in light of these hazard and risk assessments, further review under the VCCEP is either unnecessary or a low priority. Accordingly, EPA is not deciding whether to include phthalates in the VCCEP Pilot at this time. Instead, EPA will reevaluate the phthalates in approximately 6 - 9 months, after many of the above-described assessments have been completed. The producers of phthalates have agreed to provide the above assessments to EPA once they are completed, and to include in that submission their assessment of the extent to which further evaluation under the VCCEP is or is not necessary. EPA will review these materials when they are received to determine which phthalates, if any, the Agency believes are appropriate for further evaluation under the VCCEP at that time. The materials submitted by the producers will be made publicly available and EPA will invite input from other stakeholders before making its decisions.

- Styrene was deferred from the pilot program because of ongoing assessments which are

well advanced and substantially equivalent to the VCCEP in that they address potential exposures and hazards to children. The assessments underway are listed below:

- 1) The Styrene Information and Research Center (SIRC), which is composed of styrene manufacturers and users, has sponsored toxicological research covering nearly all the health endpoints to be addressed by the VCCEP and has funded additional two-generation reproduction and developmental neurotoxicity testing (Ref. 9).
- 2) The Center for Risk Analysis at the Harvard School of Public Health has created a risk assessment panel on styrene. The panel is undertaking an exposure assessment and an independent hazard analysis of styrene and is expected to include an evaluation of risks to children's health in its review (Ref. 9). The SIRC was asked to submit exposure data to support the assessment being conducted at Harvard (Ref. 9) which is expected to be available to EPA by July 2001.
- 3) EPA's Integrated Risk Information System (IRIS) program is currently conducting an assessment of available hazard data on styrene which will address all of the health endpoints included in the VCCEP. The IRIS assessment will address children as a subpopulation in its review and may include both short term and long term health values for children in the IRIS summary document which EPA will issue for styrene (Ref. 9).

EPA believes these assessments will provide helpful information for whether the risks of styrene to children have been adequately characterized. EPA may determine after receipt of these hazard, exposure, and risk assessments, that further review under the VCCEP is either unnecessary or a low priority. As with the case with phthalates, materials submitted by the producers will be made publicly available and EPA will invite input from other stakeholders before making its decision.

Table 5: Chemicals Identified for the VCCEP Pilot									
CAS No.	CHEMICAL NAME	HPV Chall. Commit. ¹	SIDS ²	Chemicals Found in Human Tissues				Chemicals Found in Human Environment	
				NHANES	NHEXAS	TEAMS	HUMAN MILK ³	NCOD	INDOOR AIR
67-64-1	Acetone		Y	Y					Y
71-43-2	Benzene		Y	Y	Y	Y		Y	Y
75-35-4	Vinylidenechloride	Y				Y		Y	Y
78-93-3	Methyl ethyl ketone		Y	Y					Y
79-01-6	Trichloroethylene		Y	Y		Y		Y	Y
80-56-8	α-Pinene	Y				Y			Y
95-47-5	o-Xylene	Y		Y		Y		Y	Y
100-41-4	Ethylbenzene		Y	Y		Y		Y	Y
106-46-7	p-Dichlorobenzene		Y	Y		Y		Y	Y
106-93-4	Ethylene dibromide	Y				Y		Y	Y
107-06-2	Ethylene dichloride	Y				Y		Y	Y
108-38-5	m-Xylene	Y				Y		Y	Y
108-88-3	Toluene		Y	Y		Y		Y	Y
108-90-7	Chlorobenzene	Y		Y		Y		Y	Y
112-40-3	n-Dodecane	Y				Y			Y
123-91-1	p-Dioxane		Y			Y			Y
124-18-5	Decane		Y			Y			Y
127-18-4	Tetrachloroethylene		Y	Y	Y	Y		Y	Y
541-73-1	m-Dichlorobenzene	Y				Y		Y	Y
1120-21-4	Undecane		Y			Y			Y
1163-19-5	Decabromodiphenylether		Y				Y		
32534-81-9	Pentabromodiphenyl ether		Y				Y		
32536-52-0	Octabromodiphenyl ether		Y				Y		

1. HPV Challenge commitment with early start year (2000 or 2001).

2. SIDS Screening Information Assessment Report is available.

3. The chemicals in this column were chemicals identified in Ref. 6 that were also reported to the TSCA IUR

Has EPA Evaluated the Biomonitoring Data Related to VCCEP Pilot chemicals?

EPA considers the biomonitoring data used for selection of chemicals for the VCCEP as strong evidence of exposure and as providing a strong rationale for identifying a chemical in this program. EPA evaluated the biomonitoring data not only for the detection of a chemical by the monitoring program, but also the detection frequency and concentration of the chemical in the tested biological medium. Examples of these data for the VCCEP chemicals are presented in Table 6. The information in the table is intended to be illustrative rather than complete. Many of the listed chemicals were also found in other human monitoring studies, some of which report the frequency of occurrence and some of which do not. The blood levels shown in the table are from the National Health and Nutrition Examination Survey III (NHANES III); the breath data are from the Total Exposure Assessment Methodology (TEAM) studies; and the breast milk data are from a recent Swedish study (Ref. 6). A number of the candidate chemicals were also studied in the National Human Exposure Assessment Survey (NHEXAS), but these data are not included in the table because all of the chemicals found in NHEXAS were also reported in NHANES III.

With the possible exception of the Swedish breast milk study, all of the monitoring programs from which these data were drawn were relatively large, broad-scale studies. The blood data were derived from a subset of the national scale NHANES III population and were used to establish reference ranges for the chemicals studied. NHEXAS involved surveys in EPA Region 5 (Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio), in the State of Arizona, and in the Baltimore metropolitan area. TEAM studies were done in communities in New Jersey, North Dakota, North Carolina, and California. Because of the size and scope of these programs, the detection of a chemical at even a relatively low frequency may indicate exposure to a large population. The significance of the reported tissue concentrations is difficult to interpret without information about the exposure events that led to a chemical's occurrence in that tissue and a detailed knowledge of that chemical's metabolic fate. At present, the reported data are best used simply as a qualitative indicator that exposure has occurred.

The first substance in Table 6 does not exactly match the corresponding entries on the pilot chemical list. However, EPA believes that the TEAM data on the mixture of meta and para isomers of dichlorobenzene are relevant to the listing of m-dichlorobenzene and p-dichlorobenzene as individual isomers. Likewise, the NHANES III data on mixed meta and para isomers of xylene are relevant to the listing of m-xylene as an individual isomer in the pilot chemical list. Also the listing of polybrominated diphenyl ethers and the data from the Swedish study (Ref. 6) is relevant to three entries on the pilot chemical list (decabromodiphenyl ether, pentabromodiphenyl ether, and octabromodiphenyl ether).

**Table 6: Frequency of Detection and Tissue Concentration
of Select VCCEP Pilot Chemicals in Human Monitoring Studies**

CAS No.	CHEMICAL NAME	MEDIUM	DETECTION FREQUENCY	CONCENTRATION
	m,p-Dichlorobenzene	breath	91% of 49	GM ¹ = 1.81 ug/m3
	m,p-Xylene	blood	≥ 75% of 649	med ² = 0.19 ppb
	Polybrominated diphenylethers	milk		mean = 4 ng/g
67-64-1	Acetone	blood	> 75% of 1062	med = 1800 ppb
71-43-2	Benzene	blood	≥ 75% of 883	med = 0.06 ppb
75-35-4	Vinylidene chloride	breath	95% of 49	WAGM ³ = 6.6 ug/m3
78-93-3	Methyl ethyl ketone	blood	> 75% of 1101	med = 5.4 ppb
79-01-6	Trichloroethylene	blood	13% of 677	
80-56-8	α-Pinene	breath	92% of 110	GM = 0.94 ug/m3
95-47-6	o-Xylene	blood	≥ 75% of 711	med = 0.11 ppb
100-41-4	Ethylbenzene	blood	≥ 75% of 631	med = 0.06 ppb
106-46-7	p-Dichlorobenzene	blood	≥ 75% of 1037	med = 0.33 ppb
106-93-4	Ethylene dibromide	breath	3% of 300	GM = 0.4 ug/m3
107-06-2	Ethylene dichloride	breath	(frequency data not available)	WAGM = 0.19 ug/m3
108-88-3	Toluene	blood	≥ 75% of 804	med = 0.28 ppb
108-90-7	Chlorobenzene	blood	21% of 1024	
112-40-3	n-Dodecane	breath	30% of 110	GM = 0.19 ug/m3
123-91-1	p-Dioxane	breath	8% of 110	GM= 0.05 ug/m3
124-18-5	Decane	breath	53% of 110	GM= 0.27 ug/m3
127-18-4	Tetrachloroethylene	blood	≥ 75% OF 590	med= 0.06 ppb
1120-21-4	Undecane	breath	56% of 110	GM= 0.28 ug/m3

¹ GM = geometric mean

² Med = median

³ WAGM = weighted average geometric mean

What Companies Manufacture or Import the VCCEP Pilot Chemicals?

Table 7 provides a listing, for each pilot chemical, of the companies that either manufacture the chemical in or import the chemical to the U.S. The company names shown are as reported to the 1998 TSCA Inventory Update Rule on a non-confidential basis. This information is provided to facilitate the formation of consortia of VCCEP sponsor companies so that burdens of the voluntary program may be shared.

Table 7: Manufacturers and Importers of VCCEP Pilot Chemicals as reported to the 1998 TSCA Inventory Update Rule on a Non-Confidential Basis

CAS Number	CHEMICAL NAME	COMPANY NAME
67-64-1	Acetone	3M
		ARCO CHEMICAL CO.
		ARISTECH CHEMICAL CORPORATION
		CELANESE, LTD.
		CHEMCENTRAL CORP.
		CIBA SPECIALTY CHEMICALS CORPORATION
		COASTAL REFINING & MARKETING, INC.
		DAKOTA GASIFICATION COMPANY
		DOW CHEMICAL COMPANY
		EASTMAN CHEMICAL COMPANY
		EL DORADO REFINING CO.
		EXXON CORPORATION
		GENERAL ELECTRIC CO.
		GEORGIA GULF CORPORATION
		HUNTSMAN SPECIALTY CHEMICAL CORPORATION
		H.B. FULLER CO.
		ICI ACRYLICS, INC
		KIMBERLY-CLARK PRINTING TECHNOLOGIES
		PARISH CHEMICAL CO.
		ROHM & HAAS CO.
		SHELL OIL CO.
		SUNOCO, INC.
		THE GOODYEAR TIRE & RUBBER COMPANY
		UNION CARBIDE CORPORATION
		WINDSOR CHEMICALS INC.
71-43-2	Benzene	ALLIED-SIGNAL INC.
		AMOCO CORPORATION
		BP OIL COMPANY
		CANADA IMPERIAL OIL LIMITED
		CATLETTSBURG REFINING LLC
		CHALMETTE REFINING, LLC
		CHEVRON PRODUCTS CO.
		CITGO PETROLEUM CORPORATION
		CITGO REFINING & CHEMS. CO, L.P.
		COASTAL EAGLE POINT OIL COMPANY
		COASTAL FUELS MARKETING, INC.
		COASTAL REFINING & MARKETING, INC.
		DAKOTA GASIFICATION COMPANY
		DELTECH CORPORATION
		DOW CHEMICAL COMPANY
		EL DORADO REFINING CO.
		EXXON CORPORATION

Table 7: Manufacturers and Importers of VCCEP Pilot Chemicals as reported to the 1998 TSCA Inventory Update Rule on a Non-Confidential Basis

CAS Number	CHEMICAL NAME	COMPANY NAME
		E.I. DUPONT DE NEMOURS & CO. INC.
		FINA OIL & CHEMICAL CO., INC.
		FISHER SCIENTIFIC CO, L.L.C.
		HUNTSMAN CHEMICAL CORPORATION
		HUNTSMAN PETROCHEMICAL CORPORATION
		KOCH PETROLEUM GROUP, LP
		LYONDELL-CITGO REFINING LP
		MARATHON ASHLAND PETROLEUM LLC.
		MOBIL CHEMICAL COMPANY
		MOTIVA ENTERPRISES, LLC
		NISSEKI CHEMICAL TEXAS INC
		PARISH CHEMICAL CO.
		PETRO-CANADA CHEMICALS INC.
		SHELL OIL CO.
		SK GLOBAL AMERICA, INC.
		STERLING CHEMICALS, INC.
		SUNOCO, INC
		THE SOMERSET REFINERY, INC.
75-35-4	Vinylidene chloride	DOW CHEMICAL COMPANY
		PPG INDUSTRIES, INC.
78-93-3	Methyl ethyl ketone	3M
		BASF CORPORATION
		CELANESE, LTD.
		CIBA SPECIALTY CHEMICALS CORPORATION
		EXXON CORPORATION
		E.I. DUPONT DE NEMOURS & CO. INC.
		GIBRALTAR CHEMICAL WORKS, INC.
		HEMPEL COATINGS (USA), INC.
		ICI AMERICAS INC.
		KIMBERLY-CLARK PRINTING TECHNOLOGIES
		MALLINCKRODT BAKER, INC.
		MITSUBISHI INT'L CORP.
		mitsui PLASTICS, INC.
		SHELL OIL CO.
		ZENECA INC.
79-01-6	Trichloroethylene	BROWNING CHEMICAL CORP.
		DOW CHEMICAL COMPANY
		ENICHEM AMERICA, INC.
		FORMOSA PLASTICS CORPORATION
		ICC CHEMICAL CORP.

Table 7: Manufacturers and Importers of VCCEP Pilot Chemicals as reported to the 1998 TSCA Inventory Update Rule on a Non-Confidential Basis

CAS Number	CHEMICAL NAME	COMPANY NAME
		ICI AMERICAS INC.
		PPG INDUSTRIES, INC.
80-56-8	α-Pinene	BUSH BOAKE ALLEN INC.
		HERCULES INC.
95-47-6	o-Xylene	CHALMETTE REFINING, LLC
		EXXON CORPORATION
		KOCH PETROLEUM GROUP, LP.
		LYONDELL-CITGO REFINING LP
		PETRO-CANADA CHEMICALS INC.
		PHILLIPS PETROLEUM COMPANY
		SK GLOBAL AMERICA, INC.
		THE SOMERSET REFINERY, INC.
		ZENECA AG PRODUCTS
100-41-4	Ethylbenzene	AMOCO CORPORATION
		ARCO CHEMICAL CO.
		BASF CORPORATION
		CHEVRON CHEMICAL CO., LLC.
		COASTAL FUELS MARKETING, INC.
		DELTECH CORPORATION
		DOW CHEMICAL COMPANY
		FINA OIL & CHEMICAL CO., INC.
		FMC CORPORATION
		GENERAL ELECTRIC CO.
		HEMPEL COATINGS (USA), INC.
		HUNTSMAN CHEMICAL CORPORATION
		HUNTSMAN POLYMERS CORPORATION
		LILLY INDUSTRIES, INC.
		NIPPON PAINT (AMERICA) CORP.
		NOVA CHEMICALS INC.
		SHELL OIL CO.
		SPIES HECKER, INC.
		STANDOX NORTH AMERICA
		STERLING CHEMICALS, INC.
		THE SOMERSET REFINERY, INC.
		WESTLAKE STYRENE CORPORATION
		ZENECA AG PRODUCTS
106-46-7	p-Dichlorobenzene	PHILLIPS PETROLEUM COMPANY
		PPG INDUSTRIES, INC.

Table 7: Manufacturers and Importers of VCCEP Pilot Chemicals as reported to the 1998 TSCA Inventory Update Rule on a Non-Confidential Basis

CAS Number	CHEMICAL NAME	COMPANY NAME
		SOLUTIA INC
		STANDARD CHLORINE OF DELAWARE
106-93-3	Ethylene dibromide	AMERIBROM, INC.
		GREAT LAKES CHEMICAL CORPORATION
107-06-2	Ethylene dichloride	BORDEN CHEMICAL, INC.
		CEDAR CHEMICAL CORP.
		CONDEA VISTA COMPANY
		DOW CHEMICAL COMPANY
		FORMOSA PLASTICS CORPORATION
		GEORGIA GULF CORPORATION
		OCCIDENTAL CHEMICAL CORPORATION
		PPG INDUSTRIES, INC.
		THE GEON COMPANY
		VULCAN CHEMICALS
		WESTLAKE MONOMERS CORP.
108-38-3	m-Xylene	AMOCO CORPORATION
		THE SOMERSET REFINERY, INC.
		ZENECA AG PRODUCTS
108-88-3	Toluene	3M
		AMOCO CORPORATION
		BASF CORPORATION
		BONAKEMI USA, INC
		CATLETTSBURG REFINING LLC
		CHALMETTE REFINING, LLC
		CHEMCENTRAL CORP.
		CHEVRON CHEMICAL CO., LLC.
		CITGO PETROLEUM CORPORATION
		CITGO REFINING & CHEMS. CO, L.P.
		COASTAL EAGLE POINT OIL COMPANY
		COASTAL FUELS MARKETING, INC.
		COASTAL REFINING & MARKETING, INC.
		CREANOVA INC.
		DAKOTA GASIFICATION COMPANY
		DIC INTERNATIONAL (USA), INC.
		DOW CHEMICAL COMPANY
		EL DORADO REFINING CO.
		ELF ATOCHEM NORTH AMERICA, INC.

Table 7: Manufacturers and Importers of VCCEP Pilot Chemicals as reported to the 1998 TSCA Inventory Update Rule on a Non-Confidential Basis

CAS Number	CHEMICAL NAME	COMPANY NAME
		EP TECHNOLOGIES LLC
		ESSO STANDARD OIL CO. PUERTO RICO
		EXXON CORPORATION
		E.I. DUPONT DE NEMOURS & CO. INC.
		FINA OIL & CHEMICAL CO., INC.
		FISHER SCIENTIFIC CO, L.L.C.
		GENERAL ELECTRIC CO.
		GREAT WESTERN CHEMICAL CO.
		HEMPEL COATINGS (USA), INC.
		HUNTSMAN CHEMICAL CORPORATION
		HUNTSMAN PETROCHEMICAL CORPORATION
		HUNTSMAN POLYMERS CORPORATION
		ITOCHU SPECIALTY CHEMICALS
		KIMBERLY-CLARK PRINTING TECHNOLOGIES
		KOCH PETROLEUM GROUP, LP
		LIOCHEM, INC.
		LYONDELL-CITGO REFINING LP
		MALLINCKRODT BAKER, INC.
		MARATHON ASHLAND PETROLEUM LLC.
		MEGALOID LABORATORIES LTD.
		MITSUI PLASTICS, INC.
		MOBIL CHEMICAL COMPANY
		NIPPON PAINT (AMERICA) CORP.
		NORDIC SYNTHESIS INC.
		OCCIDENTAL CHEMICAL CORPORATION
		RED SPOT PAINT & VARNISH CO., INC.
		SHELL OIL CO.
		SHIN-ETSU SILICONES OF AMERICA, INC.
		SIEGWERK, INC.
		SK GLOBAL AMERICA, INC.
		STERLING CHEMICALS, INC.
		SUNOCO, INC
		VAN WATERS & ROGERS INC.
		VON ROLL ISOLA USA, INC.
		WESTLAKE STYRENE CORPORATION
		ZENECA AG PRODUCTS
		ZENECA INC.
108-90-7	Chlorobenzene	PPG INDUSTRIES, INC.
		SOLUTIA INC
		THE GEON COMPANY
112-40-3	n-Dodecane	CONDEA VISTA COMPANY

Table 7: Manufacturers and Importers of VCCEP Pilot Chemicals as reported to the 1998 TSCA Inventory Update Rule on a Non-Confidential Basis

CAS Number	CHEMICAL NAME	COMPANY NAME
		HUMPREY CHEMICAL CO.
		SHELL OIL CO.
		SOLUTIA INC
123-91-1	p-Dioxane	FERRO CORPORATION
124-18-5	Decane	CASCHEM, INCORPORATED
		CONDEA VISTA COMPANY
		PHILLIPS PETROLEUM COMPANY
		STERLING CHEMICALS, INC.
127-18-4	Tetrachloroethylene	DOW CHEMICAL COMPANY
		FORMOSA PLASTICS CORPORATION
		GREAT WESTERN CHEMICAL CO.
		ICI AMERICAS INC.
		PPG INDUSTRIES, INC.
		THE GEON COMPANY
		VULCAN CHEMICALS
541-73-1	m-Dichlorobenzene	STANDARD CHLORINE OF DELAWARE
1120-21-4	Undecane	CONDEA VISTA COMPANY
		SHELL OIL CO.
1163-19-5	Decabromodiphenylether	AMERIBROM, INC.
		CHISSO AMERICA, INC.
		DOW CHEMICAL COMPANY
		GREAT LAKES CHEMICAL CORPORATION
32534-81-9	Pentabromodiphenyl ether	GREAT LAKES CHEMICAL CORPORATION
32536-52-0	Octabromodiphenylether.	GREAT LAKES CHEMICAL CORPORATION

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APPENDIX I
DESCRIPTIONS OF DATA
SOURCES USED FOR CHEMICAL SELECTION
FOR THE VCCEP

National Health and Nutrition Examination Survey III (NHANES III):

NHANES III was conducted between 1988 through 1994 on 33,994 people and focused primarily on basic health and nutritional parameters such as blood pressure, immunization status, and nutritional blood measures. NHANES III included a special study that looked at the blood levels of 32 volatile organic compounds (VOCs) in a sample of about 800 volunteers from the overall NHANES study. Eleven compounds were found with high frequency and the data on these 11 compounds were sufficient to establish reference levels (e.g. median, 95th percentile) for the nonoccupationally exposed U.S. population. Another five compounds were found in at least 10% of the samples.

Reference

Ashley et al 1994. Blood Concentrations of Volatile Organic Compounds in a Nonoccupational ly Exposed US Population and in Groups with Suspected Exposure. Clin. Chem. Vol. 40 No. 7, pp. 1401-1404.

National Human Adipose Tissue Survey

The National Adipose Tissue Survey (NHATS) analyzed human adipose (fatty) tissue specimens to monitor human exposure to potentially toxic chemicals. Pathologists and medical examiners from 47 metropolitan statistical areas collected tissue specimens from cadavers and surgical patients during the time period between 1970-1987. These specimens were analyzed for organochlorine pesticides, PCBs, dioxins and furans, volatile organics, semivolatile organics, and trace elements. However, not all compounds were analyzed over the complete time period from 1970 - 1987. Throughout the 1970's and early 1980's the chemical residues of primary interest where organochlorine pesticides and PCBs. During 1982, volatile and semivolatile organic compounds were included in the survey. NHATS was the primary activity of the National Human Monitoring Program (NHMP), operated by the EPA Office of Pollution Prevention and Toxics (USEPA/OPPT), until the early 1990s.

NHATS References

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“Chlorinated Dioxins and Furans in the General U.S. Population NHATS FY87

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"Semivolatile Organic Compounds in the General U.S. Population: NHATS FY86 Results Volume I", EPA Office of Pollution Prevention and Toxics, 1994. (NTIS PB94-209525)

"Characterization of HRGC/MS Unidentified Peaks from the Analysis of Human Adipose Tissue Volume I - Technical Approach," EPA Office of Toxic Substances, 1987 (NTIS PB88-100367)

"Broad Scan Analysis of the FY82 National Human Adipose Tissue Survey Specimens Volume II - Volatile Organic Compounds," EPA Office of Toxic Substances, 1986 (NTIS PB87-177226)

"Characterization of HRGC/MS Unidentified Peaks from the Analysis of Human Adipose Tissue Volume II - Appendices," EPA Office of Toxic Substances, 1987 (NTIS PB88-100375)

"Broad Scan Analysis of Human Adipose Tissue: Volume III - Semivolatile Organic Compounds," EPA Office of Toxic Substances, 1986 (NTIS PB87-180519)

"Broad Scan Analysis of National Human Adipose Tissue Survey Specimens Volume IV - Polychlorinated Dibenzo-p-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs)," EPA Office of Toxic Substances, 1986. (NTIS PB87-177234)

"Broad Scan Analysis of the FY82 National Human Adipose Tissue Survey Specimens Volume V - Trace Elements," EPA Office of Toxic Substances, 1986. (NTIS PB87-180527)

"Mass Spectral Confirmation of Chlorinated and Brominated Diphenylethers in Human Adipose Tissues," EPA Office of Toxic Substances, 1990 (NTIS PB91-159699)

"Brominated Dioxins and Dibenzofurans in Human Adipose Tissue," EPA Office of Toxic Substances, 1990 (NTIS PB91-103507)

"Identification of SARA Compounds in Adipose Tissue," EPA Office of Toxic Substances, 1989 (NTIS PB90-132564)

National Human Exposure Assessment Survey:

The National Human Exposure Assessment Survey (NHEXAS) describes the distribution of human exposure to multiple chemicals from multiple routes and sources on a community and regional scale and its association with environmental concentrations and personal activities. NHEXAS focuses on the comprehensive exposure of people to multiple environmental pollutants from multiple routes and sources to address some of the limitations of single-chemical, and single media exposure route studies. To accomplish this, hundreds of subjects were randomly selected from several areas of the country and asked to participate. Researchers measured the levels of chemicals in the air participants breathe; in food, drinking water, and other beverages; and in the soil and dust around their homes. Measurements were also made of chemicals in biological samples (including blood and urine) provided by some participants. Finally, participants completed questionnaires to help identify possible sources of exposure to chemicals. NHEXAS in its fullest sense is a conceptual design which utilizes (a) representative sampling (probability-based sampling of a given population), (b) environmental sampling of air, water, soil/dust, © personal monitoring of air, food and beverages (duplicate diet) and dermal measurements, (d) biomarkers, and (e) questionnaires.

NHEXAS References

Sampling Design, Response Rates, and Analysis Weights for the National Human Exposure Assessment Survey (NHEXAS) in EPA Region 5, R.W. Whitmore, M.Z. Byron, C.A. Clayton, K.W. Thomas, H.S. Zelon, E.D. Pellizzari, P.J. Lioy and J.J. Quackenboss, *Journal of Exposure Analysis and Environmental Epidemiology*, Volume 9, Number 5, September/October 1999, pages 369-380.

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Spatial Distributions of Arsenic Exposure and Mining Communities from NHEXAS Arizona, Mary Kay O'Rourke, Séumas P. Rogan, Shan Jin, and Gary L. Robertson, *Journal of Exposure Analysis and Environmental Epidemiology*, Volume 9, Number 5, September/October 1999, pages 446-455.

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The EL Sampler: A Press Sampler for the Quantitative Estimation of Dermal Exposure to Pesticides in House Dust, Rufus D. Edwards and Paul J. Lioy, Journal of Exposure Analysis and Environmental Epidemiology, Volume 9, Number 5, September/October 1999, pages 521-529.

Total Exposure Assessment Methodology:

The Total Exposure Assessment Methodology (TEAM) study was designed to develop methods to measure individual total exposure (exposure through air, food, and water) and resulting body burden of toxic and carcinogenic chemicals, and to apply these methods within a probability-based sampling framework to estimate the exposures and body burdens of urban populations in several U.S. cities. The TEAM Study reports the results of eight monitoring studies performed in five communities during different seasons of the year. Breath, personal, outdoor, and water samples were collected for volatile organic compounds. Results of the TEAM Study are reported in a four volume report entitled: The Total Exposure Assessment Methodology (TEAM) Study. Two of the four volumes provide data in a form that can be incorporated into a priority-setting database. These volumes are: (1) The Total Exposure Assessment Methodology (TEAM) Study: Elizabeth and Bayonne, New Jersey, Devils Lake, North Dakota, and Greensboro, North Carolina: Volume II. Part 2 and (2) The Total Exposure Assessment Methodology (TEAM) Study: Selected Communities in Northern and Southern California: Volume III. Altogether the TEAM Study provides data on about 30 volatile organic compounds from breath, personal air, outdoor air, and water samples.

Everything Added to Food in the United States Database:

The Everything Added to Food in the United States (EAFUS) database is a compilation of various food additives created under an ongoing program known as the Priority-based Assessment of Food Additives (PAFA). This database is maintained by the U.S. Food and Drug Administration (FDA) Center for Food Safety and Applied Nutrition (CFSAN) and contains information regarding ingredients added to food that FDA has approved as direct or indirect food additives, or listed and affirmed as generally regarded as safe (GRAS).

The EAFUS database contains administrative and chemical information for more than 3,000 substances added to food. For 2,000 of those substances, toxicological information is also available. The database contains only a partial list of all food ingredients that may be lawfully added to food due to the fact that under federal law, some ingredients may be

added to food under a GRAS determination made independently from FDA. A list of all of the substances in EAFUS is available free of charge at <http://vm.cfsan.fda.gov/~dms/eafus.html>. The fields available on-line include the name of the chemical, the CAS number, the type of toxicologic information available for the chemical in the EAFUS database, and the CFR citation where the chemical is regulated. The complete database (*Food Additives Toxicology, Regulation, and Properties* by Fergus M. Clydesdale, published December 1996, catalog number 8580), including abstracts of over 7,000 toxicology studies, is available on CD-ROM from CRC Press for \$375.

National Drinking Water Contaminant Occurrence Database:

The National Drinking Water Contaminant Occurrence Database (NCOD) provides data on the occurrence and concentration of unregulated contaminants in drinking water. NCOD was developed to satisfy the statutory requirements set by Congress in the 1996 SDWA amendments. The purpose of the database is to support EPA's decisions related to identifying contaminants for regulation and subsequent regulation development. The NCOD contains occurrence data from both Public Water Systems and other sources (like the U.S. Geological Survey National Water Information System) on physical, chemical, microbial and radiological contaminants for both detections and non-detects.

NCOD contains occurrence monitoring from sampling locations throughout a Public Water System, therefore a detection value does not necessarily mean the contaminant would be found at the tap. There are some summary statistics, but no actual analysis of the data is provided. Also, NCOD contains data for only unregulated contaminants required to be monitored by public water systems, even though EPA has not set health-based drinking water maximum contaminant levels for this subset of contaminants. This subset is covered by the Unregulated Contaminant Monitoring Rule, or UCMR. Currently the NCOD does not contain occurrence data for all water systems and all states. The only Public Water System data contained in NCOD is data that has been reported by States to the Safe Drinking Water Information System (SDWIS). Historical data goes back to 1983.

EPA ORD Sources of Air Monitoring Data:

The ORD sources consist of eight journal articles and reports that provide data on approximately 400 compounds. Quantitative information on the concentrations and frequency of occurrence of pollutants in ambient and indoor air is available. There are also some quantitative data on the concentrations and frequency of occurrence of pollutants from personal monitoring samples.

Air Monitoring References

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Kelly et al., ES&T, 28(8): 378A-387A, 1994. A comprehensive update of Shah and Singh, 1988.

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